

=> FILE REG

FILE 'REGISTRY' ENTERED AT 17:30:02 ON 22 DEC 2006  
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=> D HIS

FILE 'LREGISTRY' ENTERED AT 15:45:19 ON 22 DEC 2006  
L1 7 S (C(L)H(L)O(L)B)/ELS (L) 4/ELC.SUB AND 1/B AND 3/O  
L2 6 S L1 AND 1/NC

FILE 'REGISTRY' ENTERED AT 15:47:04 ON 22 DEC 2006  
E SODIUM BOROHYDRIDE/CN  
L3 1 S E3

FILE 'HCA' ENTERED AT 15:50:49 ON 22 DEC 2006  
L4 38751 S L3 OR NABH4 OR NAH4B OR (SODIUM# OR NA) (W) (BOROHYDRIDE#  
L5 331 S L3/P

FILE 'REGISTRY' ENTERED AT 15:51:24 ON 22 DEC 2006  
L6 3534 S (C(L)H(L)O(L)B)/ELS (L) 4/ELC.SUB AND 1/B AND 3/O  
L7 3162 S L6 AND 1/NC

FILE 'HCA' ENTERED AT 15:52:23 ON 22 DEC 2006  
L8 10847 S L7

FILE 'REGISTRY' ENTERED AT 15:52:35 ON 22 DEC 2006  
E SODIUM ALUMINUM HYDRIDE/CN  
L9 1 S E3

FILE 'HCA' ENTERED AT 15:55:18 ON 22 DEC 2006  
L10 885 S L9 OR NAALH4 OR NAH4AL OR (SODIUM# OR NA) (A) (ALUMINUM#

FILE 'REGISTRY' ENTERED AT 15:55:46 ON 22 DEC 2006  
E SULFURIC ACID/CN  
L11 1 S E3

FILE 'HCA' ENTERED AT 15:57:01 ON 22 DEC 2006  
L12 428676 S L11 OR H2SO4 OR (SULFURIC# OR SULFERIC# OR SULPHERIC# O

FILE 'REGISTRY' ENTERED AT 16:01:09 ON 22 DEC 2006  
E ALUMINUM SULFATE/CN  
L13 1 S E3

FILE 'HCA' ENTERED AT 16:02:19 ON 22 DEC 2006  
L14 48145 S L13 OR AL2(W).SO4(W)3 OR ALUM# OR (ALUMINUM# OR ALUMINIU

L15 3 S L5 AND L8 AND L10  
L16 0 S L15 AND L12  
L17 0 S L15 AND L14  
L18 7 S L4 AND L8 AND L10  
L19 1 S L18 AND L12  
L20 0 S L18 AND L14  
E ALCOHOLS/CV  
L21 148828 S E3  
L22 0 S L15 AND L21  
L23 1 S L18 AND L21  
L24 4 S L15 OR L19 OR L23

FILE 'REGISTRY' ENTERED AT 16:10:13 ON 22 DEC 2006

E BORIC ACID/CN

L25 1 S E3  
L26 1 S E8

FILE 'HCA' ENTERED AT 16:11:50 ON 22 DEC 2006

L27 56410 S L25 OR L26 OR H3BO3 OR B(W)OH(W)3 OR BH3O3 OR BO3H3 OR  
L28 2 S L5 AND L27 AND L21  
L29 14 S L4 AND L27 AND L21  
L30 4 S L29 AND L12  
L31 2 S L29 AND L14  
L32 1 S L29 AND L10

FILE 'REGISTRY' ENTERED AT 16:15:38 ON 22 DEC 2006

E SODIUM/CN

L33 1 S E3  
E ALUMINUM/CN  
L34 1 S E3  
E HYDROGEN/CN  
L35 1 S E3

FILE 'HCA' ENTERED AT 16:16:25 ON 22 DEC 2006

L36 223512 S L33  
L37 387855 S L34  
L38 320118 S L35  
L39 1 S L29 AND L36  
L40 2 S L29 AND L37  
L41 0 S L29 AND L38  
L42 72 S L4 AND L27 AND (ALCOHOL## OR ALC# OR ROH)  
L43 24 S L42 AND L12  
L44 2 S L42 AND L14  
L45 3 S L42 AND L10  
L46 2 S L43 AND L5  
L47 1 S L15 AND (ALCOHOL## OR ALC# OR ROH)  
L48 3 S L18 AND (ALCOHOL## OR ALC# OR ROH)  
L49 5 S L24 OR L47 OR L48

L50 4 S L29 AND L43  
 L51 9 S L28 OR L30 OR L31 OR L32 OR L39 OR L40 OR L44 OR L45 OR  
 L52 8 S L29 NOT L51  
 L53 18 S L43 NOT (L51 OR L52)  
 L54 4 S 1840-2003/PRY,PY AND L49  
 L55 6 S 1840-2003/PRY,PY AND L51  
 L56 7 S 1840-2003/PRY,PY AND L52  
 L57 18 S 1840-2003/PRY,PY AND L53

=> FILE HCA

FILE 'HCA' ENTERED AT 17:30:06 ON 22 DEC 2006

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=> D L54 1-4 CBIB ABS HITSTR HITIND

↓ ↓ ↓ Claim 1 and related

L54 ANSWER 1 OF 4 HCA COPYRIGHT 2006 ACS on STN

130:239576 Manufacture of sodium borohydride in high yield. Iwao, Tetsuya; Yamamura, Kiyoshi (Nippon Aluminum Alkyls, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11079733 A2 **19990323** Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-237056 19970902.

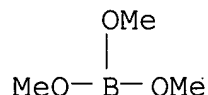
AB In the manuf. of sodium borohydride by stirring sodium hydride or **sodium aluminum hydride** and trialkyl borate in a hydrocarbon solvent, a milling medium is added into the hydrocarbon solvent and the revolution no. of the homogenizer is maintained at 5000-20000 rpm. The milling medium is selected from ceramic or metal having spherical particle diam. 0.5-10 mm.

IT **121-43-7**, Trimethylborate **688-74-4**, Tributyl borate **13770-96-2**, **Sodium aluminum hydride**

(in manuf. of sodium borohydride in high yield)

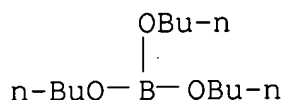
RN 121-43-7 HCA

CN Boric acid (H3BO3), trimethyl ester (8CI, 9CI) (CA INDEX NAME)

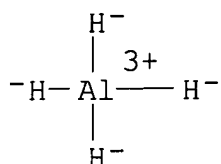


RN 688-74-4 HCA

CN Boric acid (H3BO3), tributyl ester (8CI, 9CI) (CA INDEX NAME)

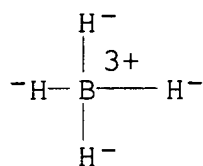


RN 13770-96-2 HCA  
CN Aluminate(1-), tetrahydro-, sodium, (T-4)- (9CI) (CA INDEX NAME)



● Na<sup>+</sup>

IT **16940-66-2P**, Sodium borohydride  
(manuf. of sodium borohydride in high yield)  
RN 16940-66-2 HCA  
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



● Na<sup>+</sup>

IC ICM C01B035-00  
ICS C01B035-12  
CC 49-5 (Industrial Inorganic Chemicals)  
IT **121-43-7**, Trimethylborate **688-74-4**, Tributyl  
borate 7646-69-7, Sodium hydride **13770-96-2**,  
**Sodium aluminum hydride**  
(in manuf. of sodium borohydride in high yield)  
IT **16940-66-2P**, Sodium borohydride  
(manuf. of sodium borohydride in high yield)

L54 ANSWER 2 OF 4 HCA COPYRIGHT 2006 ACS on STN

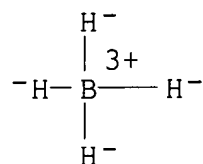
118:83958 Manufacture of high-purity sodium borohydride. Iwao, Tetsuya; Sakaki, Takao; Yamamura, Kiyoshi; Asao, Masahiko (Mitsui Toatsu Chemicals, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 04292401 A2 **19921016** Heisei, 5 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1991-51979 19910318.

AB The high-purity NaBH<sub>4</sub> is prepd. by reacting trialkoxyborane B(OR<sub>1</sub>)<sub>3</sub> and/or trialkoxyboroxin (R<sub>2</sub>-O-B-O)<sub>3</sub> with alkoxy-substituted **NaAlH<sub>4</sub>** [NaAlH<sub>x</sub>(OR<sub>2</sub>)<sub>4-x</sub>] (R<sub>1</sub>, R<sub>2</sub> = aliph., cycloaliph., arom. hydrocarbyl or alkoxyalkyl). No ether is used in the reaction process.

IT **16940-66-2P**  
(manuf. of, by reacting alkoxyboranes and alkoxyboroxins with alkoxy-substituted **sodium aluminum hydride**)

RN 16940-66-2 HCA

CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)

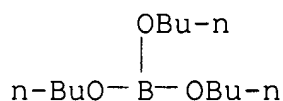


● Na<sup>+</sup>

IT **688-74-4**, Tri-n-butoxyborane  
(reaction of, with alkoxy-substituted **sodium aluminum hydride**, for high-purity sodium boron hydride)

RN 688-74-4 HCA

CN Boric acid (H<sub>3</sub>BO<sub>3</sub>), tributyl ester (8CI, 9CI) (CA INDEX NAME)



IC ICM C01B006-21

CC 49-5 (Industrial Inorganic Chemicals)

ST sodium borohydride manuf; alkoxyborane sodium boron hydride; alkoxyboroxin sodium boron hydride; alkoxy **sodium aluminum hydride** borohydride

IT **16940-66-2P**

(manuf. of, by reacting alkoxyboranes and alkoxyboroxins with alkoxy-substituted **sodium aluminum hydride**)

IT 101-36-0, Tri-n-butoxyboroxin **688-74-4**, Tri-n-butoxyborane 61048-74-6

(reaction of, with alkoxy-substituted **sodium aluminum hydride**, for high-purity sodium boron hydride)

L54 ANSWER 3 OF 4 HCA COPYRIGHT 2006 ACS on STN

116:135528 Performance-oriented packaging standards; changes to classification, hazard communication, packaging and handling requirements based on UN standards and agency initiative. (United States Dept. of Transportation, Washington, DC, 20590-0001, USA). Federal Register, 55(246), 52402-729 (English) 21 Dec 1990. CODEN: FEREAC. ISSN: 0097-6326.

AB The hazardous materials regulations under the Federal Hazardous Materials Transportation Act are revised based on the United Nations recommendations on the transport of dangerous goods. The regulations cover the classification of materials, packaging requirements, and package marking, labeling, and shipping documentation, as well as transportation modes and handling, and incident reporting. Performance-oriented stds. are adopted for packaging for bulk and nonbulk transportation, and SI units of measurement generally replace US customary units. Hazardous material descriptions and proper shipping names are tabulated together with hazard class, identification nos., packing group, label required, special provisions, packaging authorizations, quantity limitations, and vessel stowage requirements.

IT **121-43-7**, Trimethyl borate **1693-71-6**, Triallyl borate **5419-55-6**, Triisopropyl borate **7664-93-9**, **Sulfuric acid**, miscellaneous **13770-96-2**, **Sodium aluminum hydride** **16940-66-2**, **Sodium borohydride** (packaging and transport of, stds. for)

L54 ANSWER 4 OF 4 HCA COPYRIGHT 2006 ACS on STN

114:65278 Manufacture of **sodium borohydride**. Hirai, Reiji; Iwao, Tetsuya; Yamamura, Kiyoshi; Nishida, Tadao; Koga, Seijiro (Mitsui Toatsu Chemicals, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 02208218 A2 **19900817** Heisei, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1989-28584 19890209.

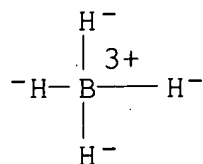
AB Trialkyl borates BZ3 (Z = **alcs.**, phenols, tetrahydrofurfuryl **alcs.**, ether **alcs.**, polyether **alcs.**) are reacted with **NaAlH4** to give **NaBH4**.

IT **16940-66-2P**, **Sodium borohydride** (manuf. of, from trialkyl borates, with **sodium**

**aluminum hydride)**

RN 16940-66-2 HCA

CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)

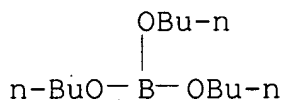


● Na<sup>+</sup>

IT 688-74-4, Tri-n-butyl borate  
(sodium borohydride manuf. from, with  
sodium aluminum hydride)

RN 688-74-4 HCA

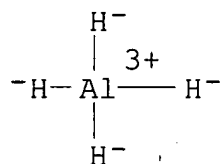
CN Boric acid (H<sub>3</sub>BO<sub>3</sub>), tributyl ester (8CI, 9CI) (CA INDEX NAME)



IT 13770-96-2, Sodium aluminum  
hydride  
(sodium borohydride manuf. from, with  
trialkyl borates)

RN 13770-96-2 HCA

CN Aluminate(1-), tetrahydro-, sodium, (T-4)- (9CI) (CA INDEX NAME)

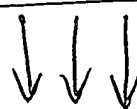


● Na<sup>+</sup>

IC ICM C01B035-00

CC 49-5 (Industrial Inorganic Chemicals)

ST **sodium borohydride** manuf trialkyl borate  
 IT **16940-66-2P, Sodium borohydride**  
 (manuf. of, from trialkyl borates, with **sodium**  
**aluminum hydride**)  
 IT **688-74-4, Tri-n-butyl borate** 14983-42-7  
 (**sodium borohydride** manuf. from, with  
**sodium aluminum hydride**)  
 IT **13770-96-2, Sodium aluminum**  
**hydride**  
 (**sodium borohydride** manuf. from, with  
 trialkyl borates)



*Claim 6 and related*

=> D L55 1-6 CBIB ABS HITSTR HITIND

L55 ANSWER 1 OF 6 HCA COPYRIGHT 2006 ACS on STN  
 142:254568 Methods and compositions for increasing the efficacy of  
 biologically-active ingredients such as antitumor agents. Windsor,  
 J. Brian; Roux, Stan J.; Lloyd, Alan M.; Thomas, Collin E. (Board of  
 Regents, the University of Texas System, USA). PCT Int. Appl. WO  
 2005014777 A2 20050217, 243 pp. DESIGNATED STATES: W: AE, AG, AL,  
 AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ,  
 DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID,  
 IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,  
 MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,  
 SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ; UA, UG, US, UZ,  
 VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY,  
 DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT,  
 SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO  
 2003-US32667 20031016. PRIORITY: US 2002-418803P 20021016.

AB The invention provides methods and compns. for modulating the  
 sensitivity of cells to cytotoxic compds. and other active agents.  
 In accordance with the invention, compns. are provided comprising  
 combinations of ectophosphatase inhibitors and active agents.  
 Active agents include antibiotics, fungicides, herbicides,  
 insecticides, chemotherapeutic agents, and plant growth regulators.  
 By increasing the efficacy of active agents, the invention allows  
 use of compns. with lowered concns. of active ingredients.

IT **7429-90-5, Aluminum, biological studies 7440-23-5,**  
**Sodium, biological studies 7664-93-9, Sulfuric**  
**acid, biological studies 10043-01-3**  
**10043-35-3, Boric acid (H3BO3**  
**), biological studies 16940-66-2**  
 (methods and compns. for increasing efficacy of biol. active  
 ingredients such as antitumor agents)

L55 ANSWER 2 OF 6 HCA COPYRIGHT 2006 ACS on STN  
 142:245529 Method of separation of small molecules from aqueous



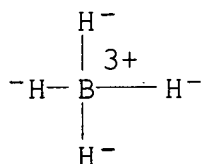
solutions. Smith, Barbara F.; Robison, Thomas W. (USA). U.S. Pat. Appl. Publ. US 2005040109 A1 20050224, 26 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-646393 20030822.

AB A method sepg. for small mols. from an aq. soln. is presented. The method can be used selectively sep. small mols. from a soln. while leaving untargeted mols. dissolved in the soln. The method uses polymer filtration to selectively remove the small mols. from the aq. soln. An aq. soln. contg. the dissolved small mol. is contacted with a polymer which is capable of forming a complex with the small mol. The aq. soln. is then subjected to ultrafiltration which creates a concd. soln. of the polymer-small mol. complex. The small mol. may be released from the polymer and the polymer recycled for another round of removal.

IT **16940-66-2D, Sodium borohydride,**  
reaction product with DCC, polyethylenimine and dl-thioctic acid  
(complexing agent; method of sepn. of small mols. from aq. solns.  
by polymer complexation and ultrafiltration)

RN 16940-66-2 HCA

CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)

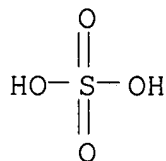


● Na<sup>+</sup>

IT **7664-93-9, Sulfuric acid, processes**  
**10043-35-3, Boric acid, processes**  
(method of sepn. of small mols. from aq. solns. by polymer  
complexation and ultrafiltration)

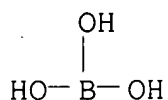
RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



RN 10043-35-3 HCA

CN Boric acid (H3BO3) (6CI, 8CI, 9CI) (CA INDEX NAME)



- IC ICM B01D061-00  
 INCL 210638000; 210650000; 210651000  
 CC 61-5 (Water)  
 IT **Alcohols, processes**  
 Aldehydes, processes  
 Amides, processes  
 Antibodies and Immunoglobulins  
 Coenzymes  
 Nitrites  
 Nucleic acids  
 Peptides, processes  
     (method of sepn. of small mols. from aq. solns. by polymer  
     complexation and ultrafiltration)
- IT 77-86-1D, Tris(hydroxymethyl)amino methane, reaction product with  
 polyethylenimine, triethylamine and chloroacetyl chloride  
 79-04-9D, Chloroacetyl chloride, reaction product with  
 polyethylenimine, tris(hydroxymethyl)amino methane and triethylamine  
 87-91-2D, Diethyl-L-tartrate, reaction product with polyethylenimine  
 106-89-8D, Epichlorohydrin, reaction product with polyethylenimine  
 121-44-8D, Triethylamine, reaction product with polyethylenimine,  
 tris(hydroxymethyl)amino methane and chloroacetyl chloride  
 538-75-0D, DCC, reaction product with dl-thioctic acid,  
 polyethylenimine and **sodium borohydride**  
 1077-28-7D, dl-Thioctic acid, reaction product with DCC,  
 polyethylenimine and **sodium borohydride**  
 9002-98-6D, Polyethylenimine, reaction product with  
 Tris(hydroxymethyl)amino methane, triethylamine and chloroacetyl  
 chloride 9002-98-6D, Polyethylenimine, reaction product with  
 diethyl-L-tartrate 9002-98-6D, Polyethylenimine, reaction product  
 with dl-thioctic acid, DCC and **sodium borohydride**  
 9002-98-6D, Polyethylenimine, reaction product with epichlorohydrin  
**16940-66-2D, Sodium borohydride,**  
 reaction product with DCC, polyethylenimine and dl-thioctic acid  
     (complexing agent; method of sepn. of small mols. from aq. solns.  
     by polymer complexation and ultrafiltration)
- IT 60-00-4, EDTA, processes 67-43-6, DTPA 74-89-5, Methylamine,  
 processes 79-06-1, Acrylamide, processes 79-10-7, Acrylic acid,  
 processes 124-40-3, Dimethylamine, processes 139-13-9,  
 Nitrilotriacetic acid 541-59-3, Maleimide 764-42-1,  
 Fumaronitrile 928-53-0, Maleonitrile 1343-98-2, Silicic acid  
 4408-64-4 7440-38-2, Arsenic, processes 7440-48-4, Cobalt,  
 processes 7553-56-2, Iodine, processes 7601-90-3, Perchloric

acid, processes 7664-38-2, Phosphoric acid, processes 7664-41-7,  
 Ammonia, processes **7664-93-9, Sulfuric**  
**acid**, processes 7778-39-4, Arsenic acid 7783-00-8,  
 Selenious acid 7783-08-6, Selenic acid **10043-35-3**,  
**Boric acid**, processes 13464-58-9, Arsenous acid  
 13598-36-2D, Phosphonic acid, derivs.  
 (method of sepn. of small mols. from aq. solns. by polymer  
 complexation and ultrafiltration)

L55 ANSWER 3 OF 6 HCA COPYRIGHT 2006 ACS on STN

141:176225 Process for production of **sodium**

**borohydride** from **sodium aluminum**

**hydride** with recycle of byproducts. Ashby, Eugene  
 Christopher (USA). U.S. Pat. Appl. Publ. US 2004166044 A1 20040826,  
 3 pp. (English). CODEN: USXXCO. APPLICATION: US 2004-775280  
 20040210. PRIORITY: US 2003-449913P 20030225.

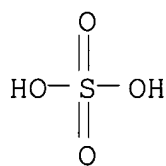
AB **Sodium borohydride** is produced by (a) combining  
 a **boric acid** ester B(OR)3 and **sodium**  
**aluminum hydride** to produce **sodium**  
**borohydride** and Al(OR)3 ; and (b) combining Al(OR)3 and  
**sulfuric acid** to produce **alum** and  
**ROH**. ROH, esp. phenol, is recycled to step (a).

IT **10043-01-3P, Alum 16940-66-2P,**  
**Sodium borohydride**

(prodn. of **NaBH4** from **NaAlH4** with recycle of  
 byproducts)

RN 10043-01-3 HCA

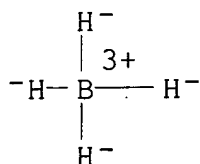
CN Sulfuric acid, aluminum salt (3:2) (9CI) (CA INDEX NAME)



●2/3 A1

RN 16940-66-2 HCA

CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



● Na<sup>+</sup>

IT 7664-93-9, Sulfuric acid, reactions

10043-35-3D, Boric acid, esters

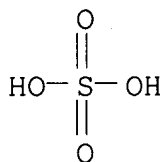
13770-96-2, Sodium aluminum

hydride

(prodn. of NaBH<sub>4</sub> from NaAlH<sub>4</sub> with recycle of byproducts)

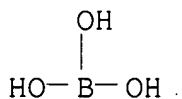
RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



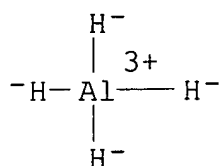
RN 10043-35-3 HCA

CN Boric acid (H<sub>3</sub>BO<sub>3</sub>) (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 13770-96-2 HCA

CN Aluminate(1-), tetrahydro-, sodium, (T-4)- (9CI) (CA INDEX NAME)



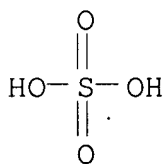
● Na<sup>+</sup>

- IC ICM C01B006-00  
 INCL 423288000  
 CC 49-5 (Industrial Inorganic Chemicals)  
 ST **sodium borohydride** manuf **boric acid ester sodium aluminum hydride**; byproduct recycling **sodium borohydride alum** manuf  
 IT Metal alkoxides  
     (aluminum; prodn. of **NaBH<sub>4</sub>** from **NaAlH<sub>4</sub>** with recycle of byproducts)  
 IT Economics  
     Recycling  
     (prodn. of **NaBH<sub>4</sub>** from **NaAlH<sub>4</sub>** with recycle of byproducts)  
 IT **Alcohols, preparation**  
     (prodn. of **NaBH<sub>4</sub>** from **NaAlH<sub>4</sub>** with recycle of byproducts)  
 IT 108-95-2P, Phenol, preparation  
     (prodn. of **NaBH<sub>4</sub>** from **NaAlH<sub>4</sub>** with recycle of byproducts)  
 IT 10043-01-3P; Alum 16940-66-2P,  
     **Sodium borohydride**  
     (prodn. of **NaBH<sub>4</sub>** from **NaAlH<sub>4</sub>** with recycle of byproducts)  
 IT 7664-93-9, Sulfuric acid, reactions  
     10043-35-3D, Boric acid, esters  
     13770-96-2, Sodium aluminum hydride  
     (prodn. of **NaBH<sub>4</sub>** from **NaAlH<sub>4</sub>** with recycle of byproducts)  
 L55 ANSWER 4 OF 6 HCA COPYRIGHT 2006 ACS on STN  
 133:309837 Process for the preparation of 3-hydroxytetrahydrofuran.  
     Kinoshita, Koichi; Moroshima, Tadashi; Yanagida, Yoshifumi;  
     Nagashima, Nobuo; Saka, Yasuhiro; Honda, Tatsuya; Fuse, Yoshihide;

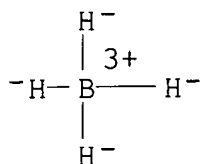
Ueda, Yasuyoshi (Kaneka Corp., Japan). PCT Int. Appl. WO 2000063199  
A1 **20001026**, 36 pp. DESIGNATED STATES: W: AE, AG, AL,  
AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK,  
DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT,  
TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ,  
TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR,  
GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG.  
(Japanese). CODEN: PIXXD2. APPLICATION: WO 2000-JP2431 20000414.  
PRIORITY: JP 1999-107398 19990415; JP 2000-7994 20000117.

AB This document discloses an industrially advantageous process for  
prepg. high-purity 3-hydroxytetrahydrofuran (useful as an  
intermediate for pharmaceuticals and agrochems.) easily and simply,  
which comprises converting a 4-halo-3-hydroxybutyric acid ester into  
a 4-halo-1,3-butanediol by reducing the ester with a boron hydride  
compd. and/or an aluminum hydride compd. in an org. solvent  
immiscible with water and treating the obtained reaction mixt. with  
an acid and water, recovering an aq. soln. contg. the diol,  
conducting the cyclization of the diol in this aq. soln., extg. the  
resulting soln. with an org. solvent immiscible with water, and  
isolating 3-hydroxytetrahydrofuran from the ext. through concn.  
and/or distn.

IT **7664-93-9, Sulfuric acid, reactions**  
**16940-66-2, Sodium borohydride**  
(process for prepn. of 3-hydroxytetrahydrofuran)  
RN 7664-93-9 HCA  
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)

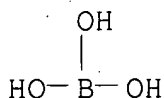


RN 16940-66-2 HCA  
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



● Na<sup>+</sup>

IT 10043-35-3, **Boric acid**, processes  
 (process for prepn. of 3-hydroxytetrahydrofuran)  
 RN 10043-35-3 HCA  
 CN Boric acid (H3BO3) (6CI, 8CI, 9CI) (CA INDEX NAME)

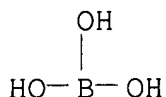


IC C07D030-720; C07C029-147; C07C031-42  
 CC 27-6 (Heterocyclic Compounds (One Hetero Atom))  
 Section cross-reference(s): 5, 63  
 IT **Alcohols, uses**  
 (C4 to C8; **alcs.** in extn. of hydroxytetrahydrofuran or  
 treatment of conc. of hydroxyterahydrofuran for distn.)  
 IT 7647-01-0, Hydrochloric acid, reactions **7664-93-9**,  
**Sulfuric acid**, reactions 10488-69-4, Ethyl  
 4-chloro-3-hydroxybutyrate **16940-66-2**, **Sodium**  
**borohydride** 16971-29-2D, Borohydride, alkali metal compds.  
 86728-85-0  
 (process for prepn. of 3-hydroxytetrahydrofuran)  
 IT 10043-35-3, **Boric acid**, processes  
 (process for prepn. of 3-hydroxytetrahydrofuran)

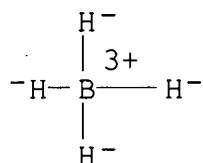
L55 ANSWER 5 OF 6 HCA COPYRIGHT 2006 ACS on STN  
 118:149162 Method for producing non-chalking foamed polymer articles.  
 Murib, Jawad H.; Damle, Pradeep D. (Quantum Chemical Corp., USA).  
 U.S. US 5182058 A **19930126**, 3 pp. (English). CODEN:  
 USXXAM. APPLICATION: US 1991-796482 19911122.  
 AB Foamed injection-molded polymer articles are manufd. using  
 polyhydric alc.-activated NaBH<sub>4</sub> as a blowing agent which evolves  
 minimal amt. of H<sub>2</sub>O and does not form byproducts that could pit or  
 chalk the polymer surface. **H3BO3** can be included with the  
 above alc., and NaBH<sub>4</sub> is kept sepd. from the other reactive

components, e.g., by encapsulation. Thus, a 2-part activator was prepd. by dry blending 68.25 parts mannitol with 68.25 parts Petrothene NA-210 (LDPE) (activator A) and 46.5 parts **H3BO3** with 46.5 parts Petrothene NA-210 (activator B). A blowing agent was prepd. by mixing 71.25 parts of FM 1776-H (NaBH<sub>4</sub> conc.) with 136.50 parts activator A and 93.00 parts activator B. PS-331 (high-impact polystyrene) (2133 g) was blended with 137 g of the above blowing agent (6% blowing agent in polystyrene) and injection-molded to give a foamed article having d. 0.61 vs. 1.05 for non-foamed PS-331.

IT **10043-35-3P, Boric acid**, miscellaneous  
(blowing agent activator, non-chalking cellular polymers manuf. by using sodium borohydride and)  
RN 10043-35-3 HCA  
CN Boric acid (H<sub>3</sub>BO<sub>3</sub>) (6CI, 8CI, 9CI) (CA INDEX NAME)



IT **16940-66-2P, Sodium borohydride**  
(blowing agent, non-chalking cellular polymers manuf. by using polyhydric alc. activator and)  
RN 16940-66-2 HCA  
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



● Na<sup>+</sup>

IC ICM C08J009-06  
INCL 264054000  
CC 38-3 (Plastics Fabrication and Uses)  
IT Polyoxyphenylenes  
(cellular, non-chalking, mannitol- and **boric acid**-activated sodium borohydride blowing agent for)  
IT **Alcohols, uses**  
(polyhydric, blowing agent activators, non-chalking cellular polymers manuf. by using sodium borohydride and)



- IT 50-70-4P, Sorbitol, miscellaneous 69-65-8P, Mannitol 115-77-5P,  
 Pentaerythritol, miscellaneous 149-32-6P, Erythritol 488-81-3P,  
 Adonitol 608-66-2P, Dulcitol 2152-56-9P, Arabitol  
**10043-35-3P, Boric acid**, miscellaneous  
 (blowing agent activator, non-chalking cellular polymers manuf.  
 by using sodium borohydride and)  
 IT **16940-66-2P**, Sodium borohydride  
 (blowing agent, non-chalking cellular polymers manuf. by using  
 polyhydric alc. activator and)  
 IT 9003-53-6, Polystyrene 9003-56-9, Acrylonitrile-butadiene-styrene  
 copolymer  
 (cellular, non-chalking, mannitol- and **boric**  
**acid**-activated sodium borohydride blowing agent for)

L55 ANSWER 6 OF 6 HCA COPYRIGHT 2006 ACS on STN

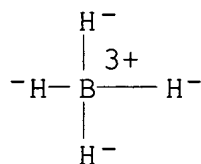
56:36581 Original Reference No. 56:6876a-b Synthesis of **sodium borohydride**. Magliona, Fernando Castaneda Anales Fac. Quim. Farm., 12, 165-70 (Unavailable) **1960**.

AB Ulexite (native Ca, Na borate octahydrate) or **H3BO3** was used to prep. B(OMe)3 which was treated with NaH to give **NaBH4**. B(OMe)3 was assayed by hydrolyzing with NaOH and detg. the borate ion. For detn. of **H3BO3** and borates, a soln. of poly(vinyl **alc.**)-I in acid medium was used in a colorimetric method which was accurate for 1.25-2.5% **H3BO3**. **NaBH4** was detd. by acid hydrolysis and titration of the free **H3BO3** or measurement of evolved H. In the purification of B(OMe)3, the MeOH-borate azeotrope was more effectively broken with ZnCl2 than with **H2SO4** or anhyd. CaCl2. When the synthesis of **NaBH4** was carried out at 270-90°, the yield was 22%, at 240-70° 12%, both with a great expenditure of B(OMe)3.

IT **16940-66-2P**, Sodium tetrahydroborate  
 (prepn. from **H3BO3** and from ulexite)

RN 16940-66-2 HCA

CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



● Na<sup>+</sup>

CC 14 (Inorganic Chemicals and Reactions)  
IT **16940-66-2P**, Sodium tetrahydroborate  
(prepn. from **H3BO3** and from ulexite)

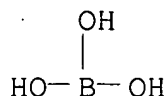
=> D L56 1-7 CBIB ABS HITSTR HITIND

L56 ANSWER 1 OF 7 HCA COPYRIGHT 2006 ACS on STN

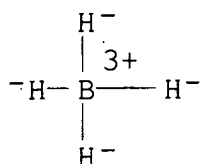
143:13244 Protein complex using immunoglobulin fragment and method for the preparation thereof. Kim, Young Min; Kim, Dae Jin; Bae, Sung Min; Lim, Chang Ki; Kwon, Se Chang; Lee, Gwan Sun (Hanmi Pharm. Ind. Co., Ltd., S. Korea). PCT Int. Appl. WO 2005047336 A1 20050526, 126 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IS, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2004-KR2944 20041113. PRIORITY: KR 2003-80299 20031113.

AB Disclosed are a protein conjugate with improved in vivo duration and stability and the use thereof. The protein conjugate includes a physiol. active polypeptide, a non-peptide polymer and an Ig Fc fragment. Since the three components are covalently linked, the protein conjugate has extended in vivo duration and enhanced stability for the physiol. active polypeptide. The protein conjugate maintains the in vivo activity at relatively high levels and remarkably increases the serum half-life for the physiol. active polypeptide, with less risk of inducing undesirable immune responses. Thus, the protein conjugate is useful for developing long-acting formulations of various polypeptide drugs.

IT **10043-35-3D**, Boric acid, dimethylamine  
salts **16940-66-2**, Sodium borohydride  
(protein complex with Ig fragment for drug delivery)  
RN 10043-35-3 HCA  
CN Boric acid (H3BO3) (6CI, 8CI, 9CI) (CA INDEX NAME)



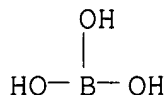
RN 16940-66-2 HCA  
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



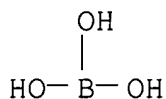
● Na<sup>+</sup>

IC ICM C07K019-00  
 CC 63-5 (Pharmaceuticals)  
 Section cross-reference(s): 2, 15  
 IT **Alcohols, biological studies**  
 (polyhydric, ethoxylated; protein complex with Ig fragment for drug delivery)  
 IT **10043-35-3D, Boric acid, dimethylamine**  
**salts 16940-66-2, Sodium borohydride**  
 25895-60-7, Sodium cyanoborohydride 35414-31-4  
 (protein complex with Ig fragment for drug delivery)

L56 ANSWER 2 OF 7 HCA COPYRIGHT 2006 ACS on STN  
 100:138654 Reductions of some representative organic compounds with **sodium borohydride**-triphenyl borate system. Yoon, Nung Min; Cho, Byung Tae; Yoo, Ji Uk; Kim, Gun Poong (Dep. Chem., Sogang Univ., Seoul, 121, S. Korea). Taehan Hwahakhoe Chi, 27(6), 434-40 (English) **1983**. CODEN: DHWHAB. ISSN: 0418-2472.  
 AB Carboxylic acids, tertiary amides, and sulfoxides were reducing using **NaBH<sub>4</sub>**-B(OPh)<sub>3</sub> (I). Thus, RCO<sub>2</sub>H and RCO<sub>2</sub>Na (R = pentyl, nonyl, CMe<sub>3</sub>, CCl<sub>3</sub>, Ph, C<sub>6</sub>H<sub>4</sub>NO<sub>2</sub>-4) were reduced to RCH<sub>2</sub>OH in 73-100% yield in 6-24 h at 25-65°. Amides R<sub>1</sub>CONMe<sub>2</sub> (R<sub>1</sub> = Ph, C<sub>6</sub>H<sub>4</sub>NO<sub>2</sub>-4, pentyl, CMe<sub>3</sub>) and N-benzoylpiperidine were similarly reduced to 86-100% amines R<sub>1</sub>CH<sub>2</sub>NMe<sub>2</sub> and N-benzylpiperidine by I at 25° in 6-24 h. Sulfoxides R<sub>2</sub>SO<sub>4</sub>R<sub>3</sub> [R<sub>2</sub>R<sub>3</sub> = (CH<sub>2</sub>)<sub>4</sub>; R<sub>2</sub> = R<sub>3</sub> = Et, Ph, CH<sub>2</sub>Ph; R<sub>2</sub> = Ph, R<sub>3</sub> = CH<sub>2</sub>Ph] gave 99-100% sulfides R<sub>2</sub>SR<sub>3</sub> at 25-65° in 1-28 h using I.  
 IT **10043-35-3, reactions**  
 (reaction of, with phenol, tri-Ph borate by)  
 RN 10043-35-3 HCA  
 CN Boric acid (H<sub>3</sub>BO<sub>3</sub>) (6CI, 8CI, 9CI) (CA INDEX NAME)



- CC 25-1 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
- IT **Alcohols, preparation**  
(prepn. of, by redn. of carboxylic acids using borohydride-triphenyl borate)
- IT 1095-03-0P  
(prepn. and redn. by **sodium borohydride** and, of carboxylates and amides and sulfoxides)
- IT 108-95-2, reactions  
(reaction of, with **boric acid**, tri-Ph borate by)
- IT **10043-35-3**, reactions  
(reaction of, with phenol, tri-Ph borate by)
- L56 ANSWER 3 OF 7 HCA COPYRIGHT 2006 ACS on STN
- 100:34096 Synthesis and extraction properties of 3-(1-hydroxyethyl)-2,6-alkanediols. Kirchanov, A. A.; Ignash, R. T.; Tel'zhenskaya, P. N.; Zanina, A. S.; Kotlyarevskii, I. L.; Shvarts, E. M. (Inst. Khim. Kinet. Gorennya, Novosibirsk, USSR). Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya (9), 2075-9 (Russian) **1983**. CODEN: IASKA6. ISSN: 0002-3353. OTHER SOURCES: CASREACT 100:34096.
- AB Addn. reaction of  $\text{RCOCH:CH}_2$  ( $\text{R} = \text{n-C}_6\text{H}_{13}$ ,  $\text{C}_6\text{-C}_8$  alkyl) with  $\text{CH}_2(\text{COMe})_2$  in  $\text{C}_6\text{H}_6$  contg.  $\text{K}_2\text{CO}_3$  at  $40^\circ$  gave  $\leq 85\%$   $\text{RCOCH}_2\text{CH}_2\text{CH}(\text{COMe})_2$ , which were reduced with  **$\text{NaBH}_4$**  in aq. MeOH to give 74-95%  $\text{HOCH}_2\text{CH}_2\text{CH}(\text{CHMeOH})_2$  (I; same R). I were comparable to other  $\beta$ -diols in their ability to ext.  **$\text{H}_3\text{BO}_3$**  from weakly acidic aq. salt solns.
- IT **10043-35-3P**, preparation  
(extn. of, with (hydroxyethyl)alkanediols)
- RN 10043-35-3 HCA
- CN Boric acid ( $\text{H}_3\text{BO}_3$ ) (6CI, 8CI, 9CI) (CA INDEX NAME)



- CC 23-7 (Aliphatic Compounds)  
Section cross-reference(s): 68
- ST hydroxyethylalkanediol prepn extn **boric acid**;  
triol prepn extn **boric acid**
- IT **Alcohols, preparation**  
Glycols, preparation  
((hydroxyethyl)alkanediols, prepn. and extn. properties of, for **boric acid**)
- IT **10043-35-3P**, preparation  
(extn. of, with (hydroxyethyl)alkanediols)
- IT 88348-75-8P

(prepn. and extn. by, of **boric acid**)

L56 ANSWER 4 OF 7 HCA COPYRIGHT 2006 ACS on STN

95:81786 Homo- or copolymers of vinyl or vinylidene halides having reduced polymer buildup in the reactor. Morningstar, Marion G.; Postel, William D., Jr. (Goodrich, B. F., Co., USA). U.S. US. 4269954 **19810526**, 9 pp. Cont. of U.S. Ser. No. 947,670, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1979-93320 19791113.

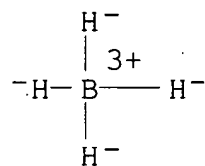
AB Reactor deposits in the emulsion polymn. of vinyl monomers, esp. vinyl chloride, are reduced by using free-radical polymn. catalysts with low water soly., and org. or inorg. activator, and an emulsifier system contg. an ammonium or alkali metal salt of a C8-20 fatty acid, sulfate, or sulfonate, and  $\geq 1$  C12-24 alkanol. Polymn. was conducted was at relatively high initial rate at 30-50° to a conversion of 25-30%, polymd. in the second stage at 35-60°, and finally in a third stage at 40-70°, with the temp. in each stage being different and chosen to maintain an essentially const. polymn. rate. The interior of the reactor was coated with a polymn. inhibitor to further reduce polymer buildup. Thus, a polymn. mixt. contg. vinyl chloride 100.0, water 125.0, C12-18 alkanols, 2.1, **boric acid** 2.0, 28% NH4OH 0.244, NaNO2 0.004, and bis(4-tert-butylcyclohexyl peroxydicarbonate [15520-11-3] 0.080 parts was homogenized, polymd. 3 h at 40°, 3 h at 45°, and 4 h at 50°, using a polymn. reactor in which the interior surfaces had been coated with 1% methanolic poly(m-phenylenediamine) [25668-03-5], giving very little reactor deposit.

IT **16940-66-2**

(catalysts, for emulsion polymn. of vinyl chloride)

RN 16940-66-2 HCA

CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



● Na<sup>+</sup>

IC C08F002-00; C08F014-06; C08F014-08

INCL 526062000

CC 35-3 (Synthetic High Polymers)

IT **Alcohols, uses and miscellaneous**

(long-chain, emulsifying agents, for vinyl chloride polymn.)

IT 7632-00-0 15520-11-3 **16940-66-2**

(catalysts, for emulsion polymn. of vinyl chloride)

L56 ANSWER 5 OF 7 HCA COPYRIGHT 2006 ACS on STN

89:110141 Methylthiomethyl ethers: their use in the protection and methylation of hydroxyl groups. Pojer, Peter M.; Angyal, Stephen J. (Sch. Chem., Univ. New South Wales, Kensington, Australia). Australian Journal of Chemistry, 31(5), 1031-40 (English) **1978**. CODEN: AJCHAS. ISSN: 0004-9425.

AB Methylthiomethyl ethers were obtained in good yield from primary, secondary, and tertiary alcs. (e.g., BuOH, 1,2,3,4-tetra-o-acetyl- $\beta$ -D-glucose, 1,2:5,6-di-o-isopropylidene- $\alpha$ -D-glucofuranose, and 1-methylcyclohexanol) by treating them with Me<sub>2</sub>SO-Ac<sub>2</sub>O-AcOH mixt. The methylthiomethyl groups were readily removed on heating the compds. with MeI in moist Me<sub>2</sub>CO. The methylthiomethyl ethers were converted into Me ethers by the action of a mixt. of NiCl<sub>2</sub> and **NaBH<sub>4</sub>** in **boric acid** buffer.

CC 33-2 (Carbohydrates)

Section cross-reference(s): 23, 24

IT **Alcohols, reactions**

(methylthiomethylation of)

L56 ANSWER 6 OF 7 HCA COPYRIGHT 2006 ACS on STN

73:21124 Identification of some oxygen-containing functional groups by reaction gas chromatography. Regnier, Frederick E.; Huang, Jenny C. (Dep. of Biochem., Purdue Univ., Lafayette, IN, USA). Journal of Chromatographic Science, 8(May), 267-71 (English) **1970**. CODEN: JCHSBZ. ISSN: 0021-9665.

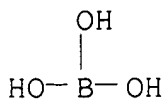
AB The differential reactivities of **H<sub>3</sub>BO<sub>3</sub>** and a series of metal hydrides toward alcs., aldehydes, ketones, esters, and epoxides in soln. and gas phase reactions has been studied. Reactive species were subtracted from the gas stream by the formation of nonvolatile derivs. and could be identified by their absence in the chromatograms. LiBH<sub>4</sub> and LiAlH<sub>4</sub> were of equiv. reactivity in precolumn flow reactors, both subtracting all functional groups studied except ethers. **NaBH<sub>4</sub>** was effective in differentiating between aldehydes and ketones while NaBH(OMe)<sub>3</sub> was effective in differentiating between ketones and all esters except acetates. **H<sub>3</sub>BO<sub>3</sub>** flow reactors were used in distinguishing primary and secondary alcs. from tertiary alcs.

IT **10043-35-3, uses and miscellaneous**

(for identification of functional groups contg. oxygen)

RN 10043-35-3 HCA

CN Boric acid (H<sub>3</sub>BO<sub>3</sub>) (6CI, 8CI, 9CI) (CA INDEX NAME)



CC 80 (Organic Analytical Chemistry)

IT **Alcohols, analysis**

Aldehydes, analysis

Esters, analysis

Ketones, analysis

(identification of, reaction gas chromatographic)

IT **10043-35-3**, uses and miscellaneous

(for identification of functional groups contg. oxygen)

L56 ANSWER 7 OF 7 HCA COPYRIGHT 2006 ACS on STN

50:77505 Original Reference No. 50:14533g-i,14534a-f **Sodium**

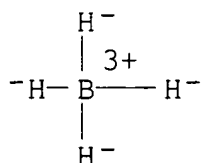
**borohydride** reduction of aldonic lactones to glycitols.

Frush, Harriet L.; Isbell, Horace S. (Natl. Bur. of Standards, Washington, DC). Journal of the American Chemical Society, 78, 2844-6 (Unavailable) **1956**. CODEN: JACSAT. ISSN: 0002-7863.

AB The appropriate lactone (1 millimole), 2 cc. Amberlite IR-120, and 10 cc. 0.05M aq. **B(OH)3** treated dropwise with stirring and cooling during 2-3 min. with 10 cc. 0.3M aq. **NaBH4**, the mixt. stirred 0.5 hr., treated again with 10 cc. **NaBH4** soln., stirred 0.5 hr., adjusted with NaOH to pH about 9, kept at about 5° overnight, passed through 10 cc. Amberlite IR-120, and freeze-dried or concd. in vacuo, the residual thin sirup repeatedly dissolved in MeOH and the solvent removed in vacuo, the residue treated with excess 0.01N NaOH and titrated after 10 min. with 0.01N HCl, the neutralized soln. passed through 5 cc. mixed Amberlite IR-120 and Duolite A-4, the effluent and washings concd. at low temp. in vacuo, and the residual sirup dissolved in a small amt. MeOH or EtOH, filtered, and seeded with the glycitols (with highly sol. glycitols iso-PrOH or iso-Pr2O was added) gave the corresponding glycitols in excellent yields; in a radioactive prepn. the product was recrystd. and the residual glycitols in the combined mother liquors isolated with inactive carrier. In this manner were reduced the following  $\gamma$ -lactones (% yield of glycitols given): D-xylono (I) 97.2, D-arabono (II) 95.8, D-glucono (III) 98.8, D-gulono (IV) 95.2, D-galactono (V) 97.2; D-glycero-D-gulo-heptono (VI) 98.6; and the following  $\delta$ -lactones: D-glucono (VII) 93.8, lactobiono (VIII). The appropriate lactone and 5 cc. 0.4M **B(OH)3** treated dropwise with cooling and stirring during 0.5 hr. with 10 cc. 0.3M **NaBH4**, kept 0.5 hr. at 0°, basified to pH 9 with NaOH, kept at 5° overnight and then treated in the usual manner gave the following yields of glycitols (lactone and % yield of glycitols given): I 94.9,

L-rhamnono- $\gamma$ -lactone 95.8, IV 96.3, V 96.5.  
D-Mannono- $\gamma$ -lactone-1-C14 (IX) (1 millimole, 46.3 $\mu$ c.) gave similarly D-mannitol-1-C14 (X), 44.7  $\mu$ c.; 2nd crop, 1.1  $\mu$ c.  
The appropriate lactone and 5 cc. ice water treated with gaseous CO<sub>2</sub> while 1 millimole **NaBH<sub>4</sub>** in 10 cc. H<sub>2</sub>O was being added dropwise during 0.5 hr., the flow of CO<sub>2</sub> discontinued, the mixt. treated dropwise during 0.5 hr. with 3 millimoles **NaBH<sub>4</sub>** in 10 cc. H<sub>2</sub>O, and the mixt. worked up in the usual manner gave the following yields of glycitol (lactone used is given): III 90.4, V 90.7, VIII 94.1, IX 98.3. Finely powd. lactone (1 millimole) added with stirring to 2 millimoles **NaBH<sub>4</sub>** and 0.1 millimole NaOMe in 10 cc. ice cold MeOH, the mixt. stirred, warmed gradually to room temp., and evapd. after 18 hrs. with a stream of air, the residue in H<sub>2</sub>O passed through 5 cc. cation exchange resin, the column washed with H<sub>2</sub>O, the combined effluents evapd. in vacuo, the **B(OH)<sub>3</sub>** removed in the usual manner, and the product recrystd. gave the glycitol. IX, 238  $\mu$ c., gave 192  $\mu$ c. X without carrier and 10  $\mu$ c. X with 200 mg. carrier. Me D-galactonate showed under the same conditions 87.6% reduction, and III 92.6%. The appropriate lactone (1 millimole) added to 10 cc. abs. EtOH contg. 3 millimoles **NaBH<sub>4</sub>** and a small amt. granulated Al, the mixt. stirred at room temp. overnight and treated in the usual manner, and the residual acid titrated showed the following % reduction: III 87.8, II 89.2, VI 95.4.  
D-Mannono- $\gamma$ -lactone-2-C14 (356 mg.) (892  $\mu$ c.) and 520 mg. HO<sub>2</sub>CCO<sub>2</sub>Na treated with stirring and cooling with 10 cc. ice water, the mixt. treated dropwise during 1 hr. with 320 mg. **NaBH<sub>4</sub>** in 20 cc. H<sub>2</sub>O, kept 3 hrs. at room temp., passed through 20 cc. cation exchange resin, mixed with 0.5 g. CaCO<sub>3</sub>, filtered, passed through 10 cc. cation exchange resin, and concd., and the **B(OH)<sub>3</sub>** removed yielded 348 mg. D-mannitol-2-C14, 851  $\mu$ c., and an addnl. 26  $\mu$ c. with 200 mg. carrier.

IT **16940-66-2, Sodium borohydride**  
(in aldonic lactone reduction)  
RN 16940-66-2 HCA  
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



● Na<sup>+</sup>



CC 10 (Organic Chemistry)  
 IT Reduction  
 (of aldonic lactones with **NaBH4**)  
 IT **Alcohols**  
 (sugar, **NaBH4** in prepn. of)  
 IT **16940-66-2, Sodium borohydride**  
 (in aldonic lactone reduction)

=> D L57 1-18 CBIB ABS HITSTR HITIND

L57 ANSWER 1 OF 18 HCA COPYRIGHT 2006 ACS on STN

77:143229 Aqueous compositions for preparing transparency-reducing metal-boron compound films. Franz, Helmut; Lecocq, David Emil (PPG Industries, Inc.). Ger. Offen. DE 2204430 **19720831**, 58 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1972-2204430 19720131.

AB Premature pptn. of the metal constituents of aq. film-forming solns. contg. B and Ni, Co, or Fe salts used for depositing transparency-reducing metal films on glass or clear plastic surfaces is prevented by addn. of a stabilizer, such as a monocarbonyl compd. or a substituted amide, which acts as a temporary chelating agent. Suitable stabilizers include Me2CO, MeCOEt, cyclohexanone, Pr2CO, diacetone **alc.**, and DMF. These stabilizers are added in small amts. (usually 0.1-2 vol. %). As a film-forming metal compd., the acetate is used, while the B compd. added is generally 0.1-1.0% **H3BO3**. The film-forming soln. also contains Na gluconate and sufficient NH4OH to maintain the pH at 7.2-7.6. The salts are reduced by using **NaBH4** at room temp. The films are deposited on activated glass or plastic surfaces by dipping or spraying. The films provide 25-40% redn. in transparency depending on the contact time between the soln. and the glass. Thus, several glass surfaces were activated by using SnCl2 and PdCl2 solns. as activators. The activated surfaces were then dipped in a mixt. of a Ni salt soln. contg. Ni acetate 5, **H3BO3** 2.5, Na gluconate 9, N2H4.-**H2SO4** 0.5 g, and Me2CO 0.05-0.20 vol. %, sufficient NH4OH for pH 7.2, and H2O to make 1l. and a soln. contg. as reducing agent 0.5 g NaHBO4, NaOH to make the pH 11.5, and H2O to make 1l. The glass surfaces were brought into contact with the mixt. for 0-3 min. to det. the effect of contact time, then rinsed and dried. A 25% redn. in transparency occurred after 15 sec, while a 40% redn. was obtained after 20 sec immersion. No premature pptn. of Ni was obsd. for immersion times <20 sec even when only 0.05 vol. % Me2CO was used as stabilizer. The stabilized solns. can be used for forming films on windows to prevent visibility from one side or to provide a heat-reflecting film.

IC C23B

CC 56-5 (Nonferrous Metals and Alloys)  
Section cross-reference(s): 57

L57 ANSWER 2 OF 18 HCA COPYRIGHT 2006 ACS on STN

71:119273 Determination of nitrate ion in chromium plating baths.  
Mochalov, K. N.; Kotik, F. I.; Tremasov, N. V.; Gil'manshin, G. G.  
(Kazan. Mekh. Zavod, Kazan, USSR). Zavodskaya Laboratoriya, 35(7),  
796 (Russian) **1969**. CODEN: ZVDLAU. ISSN: 0321-4265.

AB Traces of NO<sub>3</sub><sup>-</sup> in Cr plating baths contg. CrO<sub>3</sub> 200-300,  
**H3BO3** 20-30, **H2SO4** 2-3, Cr<sup>3+</sup> ≤ 7, and Fe<sup>3+</sup>  
≤ 8 g./l. are detd. by redn. to NH<sub>3</sub> with Ni boride,  
neutralization of the NH<sub>3</sub> with excess acid, and back titrn. of the  
acid with alkali. Addn. of 0.5-0.6 g. **NaBH4** eliminates  
Cr<sup>2O7</sup><sup>2-</sup> interference and maintains the reducing activity of Ni  
boride. The latter is prepared by pptn. from NiCl<sub>2</sub> soln. with  
**NaBH4**, the indicator is a mixt. of 3 parts of 0.1%  
**alc.** soln. of bromocresol green and 1 part of 0.2%  
**alc.** soln. of methyl red. The sensitivity is 0.0247 g./l.  
NO<sub>3</sub><sup>-</sup>, Cr<sup>3+</sup>, SO<sub>4</sub><sup>2-</sup>, and BO<sub>2</sub><sup>-</sup> do not interfere with the redn. of NO<sub>3</sub><sup>-</sup>.

CC 79 (Inorganic Analytical Chemistry)

L57 ANSWER 3 OF 18 HCA COPYRIGHT 2006 ACS on STN

68:87448 Stereochemistry. XXII. Bromination in the  
4,4-dimethyl-5 $\alpha$ -estrane and 5 $\beta$ -methylestrane series.  
Cleavage of neopentyl epoxides. Francois, Philippe; Levisalles,  
Jacques (Lab. Chim. Org., Fac. Sci. Nancy, Nancy, Fr.). Bulletin de  
la Societe Chimique de France (1), 318-29 (French) **1968**.  
CODEN: BSCFAS. ISSN: 0037-8968.

GI For diagram(s), see printed CA Issue.

CC 32 (Steroids)

L57 ANSWER 4 OF 18 HCA COPYRIGHT 2006 ACS on STN

68:49054 Fluorinated **alcohols** and ethers. Gilbert, Everett  
E.; Veldhuis, Benjamin (Allied Chemical Corp.). U.S. US 3352928  
**19671114**, 4 pp. (English). CODEN: USXXAM. APPLICATION: US  
19650914.

AB (F<sub>2</sub>CH)<sub>2</sub>CO 520 was added with stirring to **NaBH4** 47 in  
(MeOCH<sub>2</sub>CH<sub>2</sub>)<sub>2</sub>O 473 parts during 2.75 hrs. at 20°. The mixt.  
was held overnight, poured into a soln. of 138 parts of concd.  
**H2SO4** in 250 parts H<sub>2</sub>O, **H3BO3** filtered off, and  
the filtrate distd. and then redistd. to give (F<sub>2</sub>CH)<sub>2</sub>CHOH (I), b.  
.apprx.109°. I was treated with Me<sub>2</sub>SO<sub>4</sub> and NaOH to give the  
Me ether (II), b. 81.0-1.5°. I with Et<sub>2</sub>SO<sub>4</sub> similarly gave  
the Et ether. I dissolved nylon 6 to 15%. II was evaluated in mice  
for anesthetic properties and had an "anesthetic index" of 7.3.

INCL 260633000

CC 23 (Aliphatic Compounds)

ST FLURO ALIPH **ALCS**; ALIPH **ALCS** FLURO;

**ALCS FLUORO ALIPH; ETHERS FLUORO ALIPH**

L57 ANSWER 5 OF 18 HCA COPYRIGHT 2006 ACS on STN

67:117061 Stereochemistry. XV. Bromo ketones in the series of 5 $\beta$ -methyl-19-norcholestane. Demarche, Alain; Gast, Charles; Jacquesy, Jean C.; Levisalles, Jacques; Schaeffer, Liliane (Fac. Sci., Nancy, Fr.). Bulletin de la Societe Chimique de France (5), 1636-42 (French) **1967**. CODEN: BSCFAS. ISSN: 0037-8968.

GI For diagram(s), see printed CA Issue.

CC 32 (Steroids)

L57 ANSWER 6 OF 18 HCA COPYRIGHT 2006 ACS on STN

64:4026 Original Reference No. 64:684b-g Synthesis and study of isoflavan-4-ols. Anjaneyulu, A. S. R.; Krishna, C. Sri; Row, L. Ramachandra (Andhra Univ., Waltair, India). Tetrahedron, 21(9), 2677-81 (English) **1965**. CODEN: TETRAB. ISSN: 0040-4020. OTHER SOURCES: CASREACT 64:4026.

CC 37 (Heterocyclic Compounds (One Hetero Atom))

L57 ANSWER 7 OF 18 HCA COPYRIGHT 2006 ACS on STN

59:8506 Original Reference No. 59:1475b-h,1476a-h,1477a-h,1478a-h,1479a-g Long-chain aliphatic substances related to bacterial lipids. Toubiana, Raoul; Asselineau, Jean (C.N.R.S., Gif-sur-Yvette, Fr.). Ann. Chim. (Paris), 7, 593-642 (Unavailable) **1962**.

GI For diagram(s), see printed CA Issue.

CC 33 (Aliphatic Compounds)

L57 ANSWER 8 OF 18 HCA COPYRIGHT 2006 ACS on STN

57:17135 Original Reference No. 57:3547a-i,3548a-d The constitution of alginic acid. Drummond, D.W.; Hirst, E. L.; Percival, Elisabeth (Univ. Edinburgh, Edinburgh, UK). Journal of the Chemical Society 1208-16 (English) **1962**. CODEN: JCSOA9. ISSN: 0368-1769.

CC 37 (Carbohydrates)

L57 ANSWER 9 OF 18 HCA COPYRIGHT 2006 ACS on STN

55:64885 Original Reference No. 55:12343b-g Reduction of cholesteryl benzoylformate (phenylglyoxylate). Bakshi, S. P.; Turner, E. E. (Univ. London). Journal of the Chemical Society 168-70 (Unavailable) **1961**. CODEN: JCSOA9. ISSN: 0368-1769. OTHER SOURCES: CASREACT 55:64885.

CC 10E (Organic Chemistry: Benzene Derivatives)

L57 ANSWER 10 OF 18 HCA COPYRIGHT 2006 ACS on STN

54:118078 Original Reference No. 54:22520d-i,22521a-d Picrotoxin and tutin. Carman, X. R. M.; Coombe, R. G.; Johns, R. B.; Ward, A. D. (Victoria Univ., Wellington, N. Z.). Journal of the Chemical Society 1965-72 (Unavailable) **1960**. CODEN: JCSOA9. ISSN: 0368-1769.

GI For diagram(s), see printed CA Issue.

CC 10F (Organic Chemistry: Condensed Carbocyclic Compounds)

L57 ANSWER 11 OF 18 HCA COPYRIGHT 2006 ACS on STN

54:62620 Original Reference No. 54:12078d-i,12079a-i,12080a-g  
2,2a,3,3a,4,5-Hexahydro-1H-cyclopent[jkl]-as-indacene. Rapoport,  
Henry; Smolinsky, Gerald (Univ. of California, Berkeley). Journal  
of the American Chemical Society, 82, 1171-80 (Unavailable)  
**1960**. CODEN: JACSAT. ISSN: 0002-7863.

GI For diagram(s), see printed CA Issue.

CC 10F (Organic Chemistry: Condensed Carbocyclic Compounds)

L57 ANSWER 12 OF 18 HCA COPYRIGHT 2006 ACS on STN

53:56628 Original Reference No. 53:10301c-i,10302a-i,10303a-i,10304a-g  
20-Oximes and 20-semicarbazones in making cortisol and  
4,5 $\alpha$ -dihydrocortisol. Brooks, S. G.; Evans, R. M.; Green, G.  
F. H.; Hunt, J. S.; Long, A. G.; Mooney, B.; Wyman, L. J. (Glaxo  
Labs., Ltd., Greenford, UK). Journal of the Chemical Society  
4614-28 (Unavailable) **1958**. CODEN: JCSOA9. ISSN:  
0368-1769. OTHER SOURCES: CASREACT 53:56628.

CC 10J (Organic Chemistry: Steroids)

L57 ANSWER 13 OF 18 HCA COPYRIGHT 2006 ACS on STN

53:34674 Original Reference No. 53:6172e-i,6173a-i Dehydration of ethyl  
2-benzyl-3-hydroxy-2-methylpentanoate. Hanley, James R., Jr.;  
Killam, H. Scott; Lanyon, Robert D.; MacKenzie, Scott (Univ. of  
Rhode Island, Kingston). Journal of Organic Chemistry, 23, 1461-4  
(Unavailable) **1958**. CODEN: JOCEAH. ISSN: 0022-3263.

CC 10F (Organic Chemistry: Condensed Carbocyclic Compounds)

L57 ANSWER 14 OF 18 HCA COPYRIGHT 2006 ACS on STN

52:29829 Original Reference No. 52:5329e-i,5330a-c Absolute  
configuration of (+)-catechol. Hardegger, E.; Gempeler, H.; Züst,  
A. (Eidg. Tech. Hochschule, Zurich, Switz.). Helvetica Chimica  
Acta, 40, 1819-22 (German) **1957**. CODEN: HCACAV. ISSN:  
0018-019X.

CC 10 (Organic Chemistry)

L57 ANSWER 15 OF 18 HCA COPYRIGHT 2006 ACS on STN

51:98801 Original Reference No. 51:17765b-g 4-O-methyl-D-glucuronic  
acid and 4-O-methyl-D-glucose. Gorin, P. A. J. (Prairie Regional  
Lab., Saskatoon). Canadian Journal of Chemistry, 35, 595-8  
(Unavailable) **1957**. CODEN: CJCHAG. ISSN: 0008-4042.

CC 10 (Organic Chemistry)

L57 ANSWER 16 OF 18 HCA COPYRIGHT 2006 ACS on STN

51:66663 Original Reference No. 51:12113c-i,12114a-e Synthesis of  
cortisone. XIX. Paper chromatography of some steroidal 11,12-diols

and -ketols. Brooks, S. G.; Hunt, J. S.; Long, A. G.; Mooney, B. (Glaxo Labs., Ltd., Greenford, UK). Journal of the Chemical Society 1175-85 (Unavailable) **1957**. CODEN: JCSOA9. ISSN: 0368-1769.

CC 10 (Organic Chemistry)

L57 ANSWER 17 OF 18 HCA COPYRIGHT 2006 ACS on STN

50:32052 Original Reference No. 50:6415b-i,6416a-c Cyclic polyolefins. XXXVII: Ring contraction in dehydrobromination of 7-bromo-1,2,5,6-dibenzo-1,3,5-cyclooctatriene. Cope, Arthur C.; Smith, Ronald Dean (Massachusetts Inst. of Technol., Cambridge). Journal of the American Chemical Society, 77, 4596-9 (Unavailable) **1955**. CODEN: JACSAT. ISSN: 0002-7863. OTHER SOURCES: CASREACT 50:32052. (prepn. of)

L57 ANSWER 18 OF 18 HCA COPYRIGHT 2006 ACS on STN

50:16360 Original Reference No. 50:3422h-i,3423a-i,3424a-d Nitrobenzene oxidation of lignin model compounds, spruce wood, and spruce "native lignin". Pew, John C. (Forest Service, U.S. Dept. of Agr., Madison, WI). Journal of the American Chemical Society, 77, 2831-3 (Unavailable) **1955**. CODEN: JACSAT. ISSN: 0002-7863.